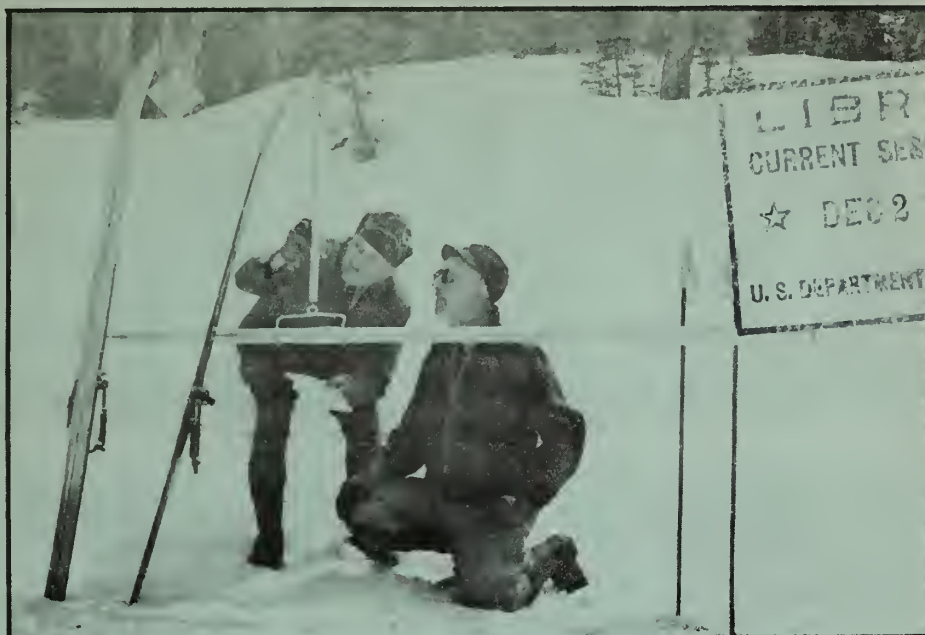


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Weighing the snow core to determine the water content

FEDERAL-STATE COOPERATIVE ⁴
SNOW SURVEYS AND IRRIGATION WATER FORECASTS
for
RIO GRANDE DRAINAGE BASIN

FEBRUARY 1, 1945

By
Division of Irrigation, Soil Conservation Service
United States Department of Agriculture
and
Colorado Agricultural Experiment Station

Data included in this report were obtained by the agencies named above in cooperation with the U. S. Forest Service, National Park Service, State Engineers of Colorado and New Mexico and other Federal, State and local organizations.

February 1, 1945

WATER SUPPLY OUTLOOK
RIO GRANDE

The water supply outlook for irrigation this coming season is fairly good for the Rio Grande drainage, fair for the Pecos and Canadian. Reservoir storage is much improved over last year at this time.

The recent snow surveys made over the watershed of the Rio Grande and its tributaries show the water content of the snow to be 17 percent greater than last year at this time, and exceeds the nine-year average by about 12 percent.

Reservoir storage in the principal reservoirs in New Mexico in the Rio Grande Valley, now exceeds the storage, as of February first, last year, by about 10 percent. The Elephant Butte, on the main channel of the river now has 1,272,100 acre-feet in storage, which is 56 percent of capacity. Caballo has 269,300 acre-feet now in storage which is 74 percent of capacity. El Vado, on the Chama River, (tributary to the Rio Grande) in northern New Mexico, has 89,300 acre-feet now in storage which is 39 percent of capacity. In the San Luis Valley, in Colorado, the principal reservoirs hold in storage 66,240 acre-feet which is 78 percent more than last year at this time and about 26 percent of capacity. The Rio Grande and tributaries are now at relatively low stage, especially in the San Luis Valley area where the streams are estimated to be only about 40 percent of normal. Because of the present limited runoff the reservoirs are filling slowly. The soil moisture throughout the farming area of the San Luis Valley is generally fair to good at this time. Present snow cover is 2 to 4 inches over the floor of the valley. In the Tres Piedras area, northern New Mexico, the soil beneath the snow cover is now wet and for both the high and low elevations the snow cover is now greater than last year at this time. The stream flow is about normal and somewhat greater than it was a year ago.

RIO GRANDE

The present outlook of the coming season's irrigation water supply for the Rio Grande drainage, as based on the present water content of the snow, is fairly good. The subnormal soil moisture conditions over the watershed in Colorado, at the start of the winter season, may later prove to be an adverse factor affecting the runoff this coming spring and summer. It is encouraging to note that the present reservoir storage is much better than it was last year, especially in the San Luis Valley area.

CANADIAN RIVER

The snow cover on the headwaters of the Canadian drainage is practically normal with a water content of 2.5 inches. In the vicinity of Tucumcari the stream flow is low, soil moisture good and range conditions reported to be very satisfactory. In the Conchas Reservoir there is now 245,000 acre-feet of active storage which is about 80 percent of the amount held last year at this time. The present water supply outlook is favorable.

PECOS RIVER

Conditions on Pecos drainage are relatively good at this time. The precipitation during the past month has been normal, soil moisture in the vicinity of Carlsbad is good and range conditions excellent. The stream flow, however, is at low stage at the present time. Storage in the principal project reservoirs is about 80 percent of the amount held at this time last year. The snow cover on the headwaters of this drainage is approximately the same as it was a year ago and exceeds the past 9-year average. Prospects for a favorable runoff this coming season are fairly good.

Explanation of Map Indicating the Water Supply Conditions for Various Drainage Basins as of February 1, 1945

This map is intended to show in a broad way the water supply conditions in the various main drainage basins in Montana, Wyoming, Colorado, New Mexico and Arizona. It is believed that the introduction of this feature of the report will provide a quick overall picture of the particular watershed in which the reader may be interested.

A series of numbers, placed in close proximity to the name of the stream, serves as the means of interpretation of the water supply situation in that particular drainage area. The first number is an index of the average depth of snow, and the second, of the average water content of the snow, as determined by surveys on the several snow courses on the watershed, the third number is the long time average water content, and the fourth the reservoir storage in percent of capacity. The letter, NR, mean no report available covering the particular item, and X, that no large reservoirs, or major storage exist on the drainage area.

As an example, 30-8-10-65. This would be interpreted as follows: There is 30 inches of snow, as an average depth, based on actual measurements taken on snow courses scattered over the drainage basin. The average water content determined by these surveys is 8 inches. Past records on these same courses show an average water content of 10 inches (which in comparison with the present condition, indicates a deficiency of 2 inches.) The last figure, 65, is the percentage of the total water in reservoir storage in relation to the total capacity of the reservoirs considered.

SNOW SURVEYS AND IRRIGATION WATER FORECASTS

for

RIO GRANDE BASIN

February 1, 1945

P R E C I P I T A T I O N D A T A

WATERSHED	STATE	Precipitation October 1 to January 31 Inches	Departure from Normal Inches	Precipitation January Inches	Departure from Normal Inches
Canadian	New Mexico	3.59	+0.58	0.77	+0.40
Rio Grande	Colorado	4.97	+1.17	0.90	-0.12
Rio Grande (N)	New Mexico	5.55	+1.37	1.04	+0.06
Rio Grande (S)	New Mexico	3.49	+0.83	0.52	+0.2
Pecos	New Mexico	3.49	+0.42	0.65	+0.12

Precipitation during January was above normal over the watershed of the Canadian and Rio Grande in New Mexico. Over the headwaters of the Rio Grande in the San Luis Valley, Colorado, the precipitation was slightly deficient. The accumulated precipitation since October 1 was, however, above normal for the Canadian Pecos and for the main Rio Grande in both New Mexico and Colorado.

SUMMARY OF FEBRUARY 1 SNOW SURVEYS AND COMPARISON OF DATA WITH THAT OF PREVIOUS YEARS BY WATERSHEDS

WATERSHEDS	Snow Depth			Water Content			Number Courses in Average	Snow Density			1945 Water Content in percent of	
	Nine Year Avg.*	1944	1945	Nine Year Avg.*	1944	1945		Nine Year Avg.*	1944	1945	Nine Year Avg.*	1944
Rio Grande	In. 28.1	In. 29.1	In. 31.2	In. 6.7	In. 6.4	In. 7.5	21	Percent 24	Percent 22	Percent 24	112	117
Canadian River	In. 12.7	In. 22.8	In. 12.0	In. 2.5	In. 2.8	In. 2.5	1	Percent 20	Percent 12	Percent 21	100	90

*Some for shorter periods.

RIO GRANDE WATERSHED

Summary of Federal and State Cooperative Snow Surveys
Issued February 10, 1945, at Fort Collins, Colo.

Main Drainage and Snow Course			Local Drainage		Location		Elev.	National Forest	Feb. 1 Snow Cover Measurements					
No.	Snow Course	Drainage	State	Locality	Description	Av. @ 1944			In. 1944	Av. @ 1945	In. 1945	Av. @ 1946	In. 1946	
RIO GRANDE														
26	Wolf Creek Pass	South Fork	Colo.	Wolf Cr. Pass	4-37N-2E	10000	Rio Grande	57.1	71.5	57.3	15.4	17.9	15.5	
27	Upper Rio Grande	Rio Grande	"	Rio Grande Res.	13-40N-4W	9350	"	21.5	27.9	19.7	3.9	5.6	3.5	
47	Silver Lakes	Alamosa R.	"	1mi. S. Silver L.	15-36N-5E	9600	"	19.8	24.5	22.3	3.4	3.7	3.7	
49	River Springs	Conejos R.	"	10mi. W. Mogote	25-33N-6E	9300	"	20.7	---	22.4	4.4	---	5.9	
74	LaVeta Pass #2	SanCristoCr.	"	LaVeta Pass	22-28S-70W	9300	SanCristoGr	22.0	20.9	28.0	4.4	3.7	5.7	
76	Summitville	Wightman Cr.	"	Summitville	30-37N-4E	11500	Rio Grande	52.8	52.0	44.0	11.9	10.7	9.2	
77	Cumbres Pass #2	Los Pinos R.	"	Cumbres Pass	17-32N-5E	10000	"	52.0	50.5	59.5	13.6	10.3	16.6	
80	Santa Maria	N. Clear Cr.	"	Santa Maria Res	8-41N-2W	9700	"	17.3	22.0	13.6	3.4	3.6	2.8	
82	Culebra	Culebra R.	"	12mi. E. San Luis	37-2N-105.2W	10000	SanCristoGr	26.3	25.6	32.2	6.2	5.2	7.8	
84	Fort Garland	Big Ute Cr.	"	6mi. N. Ft. Garland	13-29N-72W	8200	"	11.4	---	17.2	2.3	---	2.6	
CANADIAN														
1	Red River	Red River	N. Mex.	6mi. SE. Red River	29-28N-15E	9500	Carson	21.6	24.5	23.0	5.8	7.1	6.2	
2	Taos Canyon	Rio de Raos	"	14mi. E. Taos	10-25N-15E	9000	"	19.6	21.1	24.7	5.5	6.3	6.6	
4	Aspen Grove	Rio En Medio	"	10mi. NE. Santa Fe	12-18N-10E	9100	Santa Fe	22.2	22.0	24.1	5.0	4.8	5.7	
5	Lee Ranch	Jemez Cr.	"	5mi. NW. Bland	3-18N-4E	9050	"	28.0	27.2	32.2	5.8	5.6	6.2	
6	Canjilon	Canjilon Cr.	"	8mi. NE. Canjilon	4-26N-6E	9500	Carson	37.5	32.5	45.1	12.6	12.1	16.3	
9	Hematite Park*	Red River	"	3mi. SE. Red R.	8-28N-15E	9500	Carson	15.2	---	18.5	3.7	---	5.2	
12	Tres Ritos	Agua Piedra	"	7mi. W. Holman	23-22N-13E	9000	"	23.1	26.8	24.0	5.0	5.8	4.6	
15	Pay Role	Spring Creek	"	6mi. SE. Hopewell	23-28N-7E	9700	"	26.9	25.4	33.9	7.0	4.9	7.8	
16	Jicarilla	Rock Lake Cr.	"	15mi. S. Dulce	9-29N-1W	8500	JicarillaR	18.8	15.5	23.1	3.8	2.2	3.0	
17	Chama Divide	Willow Creek	"	6mi. W. Chama	36.9N-106.7W	7750	Off Forest	21.6	16.2	23.6	4.9	3.1	5.3	
18	Chamita	Chamita Cr.	"	6mi. NW. Chama	36.9N-106.7W	8500	"	29.6	25.5	37.7	6.7	4.9	9.8	
19	Cordova	Cordova Canyon	"	2mi. W. Tres Ritos	22-22N-13E	10100	Carson	32.8	34.2	36.3	7.4	7.5	8.0	
20	Panchuela #2	Panchuela Cr.	"	2mi. N. Cowles	27-19N-12E	8300	Santa Fe	17.1	19.5	23.4	3.7	4.0	4.5	
21	Big Tesuque	Big Tesuque Cr.	"	10mi. NE. Santa Fe	17-18N-11E	10000	Santa Fe	22.0	24.8	27.8	6.0	6.5	8.2	
						Average for Drainage		23.1	29.1	31.2	6.7	6.4	7.5	
CANADIAN														
9	Hematite Park	Moreno Creek	N. Mex.	3mi. SE. Red R.	8-28N-15E	9500	Carson	15.2	---	18.5	3.7	---	5.2	
10	Ocate Mesa	Ocate Creek	"	3mi. E. Black L.	25-24N-16E	9200	Off Forest	12.7	22.8	12.0	2.5	2.8	2.5	
						Average for Drainage		12.7	22.8	12.0	2.5	2.8	2.5	

*On adjacent drainage

@Average for period of record

The following organizations cooperate in the snow surveys and irrigation water supply forecasts for the Colorado, Missouri-Arkansas and Rio Grande watersheds by furnishing funds or services.

STATE

Colorado State Engineer
Wyoming State Engineer
Utah State Engineer
New Mexico State Engineer
Montana State Engineer
Nebraska State Engineer
Colorado Experiment Station
Colorado Extension Service
Montana Experiment Station
Utah Experiment Station

FEDERAL

Department of Agriculture
Forest Service
Soil Conservation Service
Department of Interior
Bureau of Reclamation
Indian Service
Geological Survey
National Park Service
Department of Commerce
Weather Bureau
War Department
Army Engineer Corps

PUBLIC UTILITIES

Colorado Public Service Company
Western Colorado Power Company
Denver and Rio Grande Western R.R. Company

MUNICIPALITIES

City of Denver
City of Boulder

WATER USERS ORGANIZATIONS

Poudre Valley Water Users' Association
Arkansas Valley Ditch Association
Colorado River Water Conservation District

IRRIGATION PROJECTS

Farmers Reservoir and Irrigation Company
San Luis Valley Irrigation District
Santa Maria Reservoir Company
Costilla Land Company
Uncompahgre Valley Water Users' Association
Wyoming Development Company
Goshen Irrigation District
Kendrick Project
Pathfinder Irrigation District
Salt River Valley Water Users' Association
San Carlos Irrigation and Drainage District

Many other organizations and individuals furnish valuable information for the snow survey reports. Their cooperation is gratefully acknowledged.

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RE: [illegible]

1. [illegible]

2. [illegible]

3. [illegible]

4. [illegible]